

Muslow July 15

Bar. 5300

6 mi. W. of window

At 5600 ft *Ephedra* & the
dense leaved yucca came
in with *Atriplex* and leaf &
shrub leaf both all along
Sagebrush & Grass
Sunset pass 5950 Cedars
(stringy bark) reach their lower
limit of zone in pass though a
few extend through & scatter
along Jacks Canon.

2 pastures a pear leaf & a small
arborescent species come in
in the pass. Thornlocks, Cabbins &
Mocking bird in Sunset Pass

July 16 Camp SW Sunset Pass
(8 miles) 6100 ft in Cedars
with the first few lower Pinons
Sialia arctica

Sylv. cedrophilus & ~~two~~ *L. texcainus* in
cedars

Cedars in heavy belt at Sheep Camp
Dove, *Tyrannus vociferans*, *Dryob. hylos.*
White-th. *Spermoph.*

Journal

1894

Wm. L. L.

1894

1894

1894

Alt. 0

Stephen James, English

E. W. Nelson

Altitudes

Winslow

Holbrook

Nasajo

Manuelito

Gallup

Frank Kitchum }
began work with } 4th a day, exp.
team on July 25 } 10 a.m. for all time

Prof. H. E. Gregory, Yale
univ. makes trip from
Keams Canyon to Nasajo

Holbrook, Ariz. July 25
Reached this place from
Winslow by R.R. The wagon arrived
at dark. Found a few English
Sparrows here. They are said
to have been brought in a car
loaded with grain. A few were
also seen at Winslow, ~~4 or 5~~
~~dozen~~ ~~4 or 5~~ dozen,
perhaps 4 or 5 dozen in each
place. Cow blackbirds, House
finches, Tyr. verticalis verticalis,
Rough winged Swallow.

July 26 & 27 Remained at
Holbrook, laid up with a
bad cold.

July 28 went to Gallup N.M.
to get eye glasses fixed & see
Country along road & meet
Goldman.

1909

July 29 Gallup, Alt
The country covered with
Juniperus monosperma & Pinus
edulis, Artemisia tridentata, Rhus
trilobata, Euthamia, Cercocarpus
etc. One Tamias seen, English Sparrows in town

July 30

Took a 2.50 train out to Manuelito
where I joined Birdseye & Kelcham
& we pulled out for Ft. Defiance
at 7.19 am. Birdseye reports having
seen English sparrows at
Ahamana, Navajo Springs,
Manuelito

Our route for the entire 35 miles to
Ft. Defiance was in a northerly course,
up about half of the distance
up a slightly winding cañada
with the bottom covered with
Sarcobatus, about half way up to

about 6500 feet where this gave
way to Artemisia tridentata
which became the predominant
shrub about 6500-7200 ft. & was
very abundant but rarely more
than 3 ft. tall. ~~with~~

The Cañada was bordered by high
abruptly walled ^{sandstone bluffs} ~~cliffs~~
that 500 to 800 ft. high ^{grown with} ~~cedars~~
^(monosperma) with cedars & ^{pinus} (edulis)
& a few Quercus gambelii near
Manuelito. A few Pinus ponderosa
grown on cool slopes & close
to & as low as Manuelito &
considerable number singly
in thin patches here & there among
the much larger number of Cedars
& Pinus. About 12 miles from manu-
elito we reached the ~~top~~ ^{head} of the draw
we followed all morning & then

(A few English Sparrows at
St. Defiance)

we reached a rolling plain
covered with sage brush &
scattered Cedar & Pinon at
an alt. of about 7000 ft. to 7200 ft.,
then we descended into the
open valley of Defiance Creek
near St. Michael Mission &
then went north up the broad
open valley of Defiance or Bonito
Creek for about 7 miles. On
the right along the east wall
of the valley, are several miles
of ^{light colored} sandstone cliffs, columns
and needles reminding me
of the Garden of the Gods in Colorado
but of much greater extent
& of far more picturesque appearance.
The road from Gallup comes
directly through a gap in this
formation.

One Cliff about 150 or 200 ft
high is ~~flat~~ very thin &
forms a tall knife blade
with a huge round window
like hole ^{over 60 ft wide} right through the
middle. We passed numerous
coal outcrops during the day.
The remarkable scarcity of bird
& animal life except for
a few colonies of Prairie Dogs
was notable. We did not see a
single rabbit or Coyote.

Citellus grammurus.

Birds seen were

Raven several pairs, 1 pair Golden
Eagles, 10 m. above Manuelito, Porcupines
couple a few; Amp. fulvicornis a few
Rock Wrens rather common; Carolina
Doves a few; Sparrow Hawks a few;
1 Falco mexicanus at St. Defiance;

1 flock Plover Jays 10 m. above
Manuelito

+ Violet Green

Cliff Swallow Rough Wg. Swallows,
Molothrus obscurus, Canyon Wren
heard at Manuelito. *Zyr. verticalis*
Sialia arctica & *S. bairdi*, *Sayornis*
sayi.

Defiance Agency is mainly made
up of stone buildings along 2 sides
of a quadrangle at extreme upper
end of the valley just where the
~~stream~~ a small stream comes
out of a box canon (Bonito Canon)
Just as we reached the place
we met Sullivan, the chief
Clerk & Proj. Gates an Inspector
out from Washington to look
over the reservation. Sullivan
was at first inclined to be dis-
countenanced ~~but~~ & I expressed
my opinion ^{of it} to Gates & ~~was~~
a little later in the eve, Sullivan

came to our camp at the agency
corral & expressed his regret & was
propose in offer of assistance which
I accepted to the extent of a
letter to their man at the sawmill
on the mountain (Mr. Casabier
& I slept in the Agency horse
corral beside our wagon - the
agent is away at Chin-lee
Alt. of Ft. Defiance 6800 ft. ^{Smiles from Manuelito.}

July 31/09

Left Ft. Defiance at 8 a.m. and
proceeded 15 m. in a NW. course
to the agency sawmill on the
road to Chin-lee.

The road led up through the high
walled Bonito Canon for several
miles above the Agency and
as along the canon above Manuelito
we saw scattered *Pinus ponderosa*

west
along the ^{base} of the easterly
wall of the Canon but all
trees on top of the mesa forming
the top of the Canon walls
as well as those predominating
in the Canon were Cedars (*monophylla*)
& *Pinus edulis* with great patches
of the pink flowered *Desmodium*
~~like the one~~ along the bottom
of the Canon. One of the most
marked ~~features~~ features of the
Canon is the ^{natural} strange column
called Kitterson's Monument
which is about ~~40~~ 40 ft high.
I secured a photog. of a Navajo
hut & a woman weaving a
blanket in the Canon.
Our route gradually led
up the course of Dryden or
Bonto Creek to open

rolling upland mesas
from 7000 to 7800 ft alt
on the ~~corral~~ ^{corral} with an abundant
growth of *Astragalus tridentatus*
& bordered in all directions
on adjacent high mesas with
the Cedar & Pinon forest.

Within 2 or 3 miles of the Saw
Mill the gray sage *tridentatus*
was abruptly replaced by a
smaller, more flattened & much
deeper, darker green sage which
resembled *tridentatus* in a general
way, but must be another species.
Prairie dog colonies were noted
all the way up at intervals
but not a single chipmunk nor
Spermophile was seen though
we secured a dull gray chip-
munk in the Agency Corral

at Defiance

~~Color~~

The saw mill is located at 7800 ft at the southern border of a large forest of *Pinus ponderosa* with a thin line of *Quercus gambelii* mixed along the border. The pine forest extends about 12 m. n.w. & west from the mill & is the belt which extends south beyond St Michael between latter place & Janado. We reached the mill about 1 P.M. & were given a room in the house occupied by the millman in charge, who W. Casebeer. Cut nearly 300000 ft with Navajo labor last year, preceding July 1, 1904.

The Navajos live scattered all over the reservation mainly in 1 or 2 families & grow a little corn & herd sheep, goats, cattle & horses. They now have gathered into villages. They work cutting lumber, make hay to take in to the agency when they sell it at 30¢ ton. They are very quiet & peaceable. The trouble last winter with By-lille was that the latter wished to pose as a leader & began talking against sending children to the agency school & to talk against the agents. An Indian ~~for~~ policeman was struck by lightning & By-lille claimed he did it by his medicine to show his power. As the result

of this talk a number of disaffected Indians gathered about him & the number kept increasing & they began buying guns & cartridges which showed the danger of the situation if allowed to go on. The agent applied for soldiers & By-lille was rounded up & 2 or 3 Indians killed & some others taken away & imprisoned. Some of the latter have been released & returned to the reservation in a completely peaceable frame of mind.

List of birds seen at
Fort Defiance & in ~~Canyon~~
Bonito Canyon July 31/09
Carpod. frontalis
Chondestes, *Pooecetes*, *Otocoris*
Spizella arizonae, *Salpinctes*
Stelgidopteryx, *Tyr. vociferans*
Sialia bairdi, ~~Ch. Cliff Swallow~~
Ammodramus melanoleucus & *Selasphorus rufus* common in canyon.
Dryobates hyloscopus, *Tachycineta thalassina*, *Corvus sinuatus*
Amphisp. bilineata, *Car. Dove*
Otocoris

The *Juniperus monosperma* predominated half way up canyon from Defiance and then gave way to *Pinus edulis* as the main tree till on top of the mesa at 7400-7600 ft the Pinon was much more numerous. Wild potatoes are reported to grow on the pine forest on this mountain.

July 31 and Aug 1/09

Birds seen on top of the
mountain from 7500 to
7800 ft.

Tyrannus vociferans, Sayornis saya,
Contopus richardsoni, Sitta nelsoni
Sialia bairdi, Oreospiza chlorura
Spizella arizonae, Parus gonfalon
Chondestes strigatus, Co. po.
Cassini, Tachycineta thalassina
Parus septentrionalis, Corvus
sinuatus, Melanerpes formicivorus.
Agelaius strigatus, Dend. auduboni
(young), Falco s. phalaenx, Bubo
Buteo borealis, Chordeiles henryi,
Robin, Cal. Dove, Rufous Hum.
Otocoris - Colaptes cafer
Geococcyx melano.

At the Saw mill (7800 ft)

We found Thomomys, Peromyscus,
Callospermophilus, Eutamias
Sciurus aberti, Peromyscus
and Cynomys and the
Indians told of Wild Cats
about the head of the canon
leading into ^{head of} Canon de Chelly.
Heavy showers in the afternoon

Aug 2 Monday

Left the Saw mill and traveled
35 miles ~~SW~~ Northwest to
George McAdams trading store
at Chin Lee. alt. 8600 ft.

It was very cool last night
& the air was clear & fine when
we left the mill at 8.30 am.

For about 12 miles we crossed
an undulating plateau at an
alt. close to 8000 ft & covered
with Pinus ponderosa but

nowhere in any heavy
growth of good timber for
mill use. About 12 m. NW
of the mill is an old well
brought & here the road
leads down the mt. on the
west slope and 2 species
of cedar, ~~the~~ & the Pinon come
in. A slender leaved
yucca ^{glauca} was common in
the pine forest & scattered
bushes & small trees of *Quercus*
gambelii were everywhere
among the pines.

The 2 cedars came in at
about 7800 ft. & on the NW slope
at 7800 ft. were a few firs
& 2 species of *Cercocarpus*
the latter ranging down to
about 6800 ft.

The large leaved yucca *babingtonii* was
rather common in pine forest 7800 ft. &
with the small leaved sp. ranges down
west slope to at least 6200 ft.

~~7800 ft. 2 kinds of cedar &~~

~~Fir & 2 sp. *Cercocarpus*~~

~~7600 ft. *Asteria tridentata*~~

~~7300 ft. *Crotophytus*~~

~~6800 ft. *Ephedra*~~

~~Last visit. — at 6800 ft~~

Asteria (dark small
leaved sp. on top of mt. in
forest & down to 7800 ft. At 7600
ft *A. tridentata* came in &
was left behind at 6800 ft
at which latter alt *Ephedra*
came in

Pinons & some cedar came
down to about 6300 ft
where they became scattering

On banks of arroyos & sandy
NW slopes at from 6200 to 6400 ft
A small leaved scrub oak came in with
a Hackberry & ironwood(?)

A single *Sciurus aberti* seen
+ shot in pine forest + a few *Eutamias*
+ *Callosperm.* 1 *Citellus grammurus*
seen at 7800 ft in lower border
of pine forest among scattered
Cedars + *Pinons*, 1 flock *Pinon jays*
1 *Cyanocitta stelleri*, *Junco*, *Robins*, *Flicker*, *Pigmy*
nuthatch, *Dryob. hylos.*, *Spiz.*
arizonae, *Dend. auduboni* +
many *Sialia bairdi* were seen
in Pine forest. At about 6000 ft
in pines a pair of *Dend. prairie*
One of them was shot + proved to be
in the juv. plumage.
On the way down the mt slope we
saw *Baeolophus inornatus* in
upper part of Pinon belt with
Panus septentrionalis. At 6400
ft. A yg. *Myiarchus cinerascens*
was shot. It had no yellowish

shade + the dusky markings on
outer tail feathers was like in
nuttallii. The western slope
of the mts to Chin Lee Valley
is in a series of small benches
+ is more abrupt than that
from Ft. Dryden. An arborescent
Cactus 12-14 in. high was scattered
down the slope from about 6500 ft.
down to the valley. The rounded bush
cactus was also seen at about
6500 ft in Pinon belt + the pear
leaved *Opuntia* ~~to~~ with numerous
long whitish spines was common
from about 7000 ft to Chin Lee.
Nowhere on this road except at
the old well ~~where there was but little~~
near lower edge of pines, This is
merely a shallow dug out seep.

Chin Lee ~~July~~ Aug. 3
Remained here all day
to see what small ruins
the valley affords. As we
came down the final slopes
last night the valley could be
seen for miles N. S. & 8 or 10 miles
across. It is without permanent
running water though recent
rains left pools here & there along the
bottom. Macabams trading
store is on a flat ~~down~~ directly at
the mouth of Canon de Chelly out
of which a small stream is
flowing now. Half a mile to the ~~west~~
northwest is located a Catholic
mission where 3 Padres are located.
Chin Lee valley has several series
of pale yellow sand dunes
and the broad mouth of Canon

de Chelly is a part of the same.
Most of the rest of the valley near
the trading store is extremely barren
& with ^{low} rocky & clayey hills forming
a "bad lands" area.
Off to the west is the flat topped
Black Mountain mesa
which is from 7 to 8000 ft on
top & the Navajo Indians who
are familiar with it say that along
practically the entire highest part of the
Black Mt. from N. to S. is a forest
of *Pinus ponderosa* with trees smaller
& more scrubby than on the Sawmill
mountain we just crossed. The
Indians say that a few scattered
yellow pines also grow on top of the
mesa south of Black Mt. but most
of the trees there are Cedar & Spruce.
This information shows that the tops

Black Mt. is transition like
top of sandmill Mt. & all the rest
of the country (below 7400 to 7600
ft alt.) is Upper Sonoran.
Birdseye caught *Thomomys*
Peromyscus & *Chaetodipus* last
night.

Aug. 4 Canyon de Chelly.
We left Chin Lee in the
morning & went about 7 miles
up Canyon de Chelly & camped
in front of the "white house" cliff
dwellers ruins. The canyon
is sandy bottomed & walled
& from 100 to 300 yds wide with
finely varied sandstone walls
rising from 100 ft near mouth
to several hundred feet (200-500)
further up. The canyon is so
steeply walled in that it is

accessible from outside at
only a few points. Leading up
the Canyon del Muerto were
wagon tracks of a party made
up of Mr Eastman of the Kodak
Co., Dr. W. Fawkes & Mr. Menden
the lecturer & his wife.

The White house ruin has one
house the farther back in the cliff
which appears to have been
whitewashed & ^{this} is suspiciously
like ^{some} modern work. The niche
in which these cliff ruins are
built is about 50 ft. from the bottom
of canyon & another set of similarly
built houses are located against
the cliff ~~at the~~ immediately under the
cliff ruins. The sticks & straw used
in the roofs of these last ruins are still
in well preserved condition & many
small corn cobs.

A few other cliff runs
were seen along the canyon
but fewer than I expected.

The Navajos have summer
hogans at many little
flats along the sides of the
canyon when they have small
fenced enclosures for hay,
corn & a few peach trees.
Some small flocks of geese
were also seen.

About 8 miles above the mouth
the canyon is strikingly picturesque.
So far as bird & plant life
is concerned it was very much
poorer than I expected.

Rock Canyon wrens, Ravens about
20 Turkey buzzards, and several
Amphisp. bilineata. One nest of the
latter, containing small eggs, was

found about 8 ft. from the ground
on the outer end of a branch of
a hackberry tree. The nest was
a flimsily made structure of grass
built on top of ^{the base of} several small branches,
at junction with main branch.

The old bird showed much anxiety
over our presence while we were
camped under her home.

The most abundant shrub in
canyon is *Sarcobatus* with *Atriplex*
confertifolia next & many small
pear-leaved cactus with long white
spines. Some of the common
cottonwoods like those on the
Little Colorado at Huclo, some
hackberry trees 15-25 ft. still
fewer walnuts, some other trees
& bushes.

Birds were put out a good sitting of

traps & caught *Perodipus*,
Neotoma (round-tailed), the mountain
Thomomys, 2 sp. of *Peromyscus*
a alkali plant *Perognathus*, *Reithro-*
dentomys and a *Spilogale* *gracilis*
I saw tracks of *Urocyon*, *Bassaris*
and 1 spec. of *Sylv. warreni*.

Aug. 5 Returned to Chin
Lee in the morning and
at 2:15 P.M. we left for Jarvis
taking a southwesterly course
across the alkali flat forming
the bottom of the valley for about 5 m.
then up on a fine mesa country
at an altitude of about 6300 ft.
On the way up the side of the
mesa were many of the small
leaved *Cercocarpus* & on the
mesa itself 2 species of *Ephedra*

(*Sarcobatus* & *Atriplex confertifolia*
abundant on the Chin Lee valley
bottom)

Euternia, *Atriplex canescens*
the white-spined pear-leaved *Opuntia*
and the small small species of
Artemisia with flat growth & small
tridentate leaves such as were abundant
from Winslow to Chavis Pass which
is not *A. tridentata* though having
the same gray color. The leaves are
smaller & it does not have a strong
well marked trunk like *tridentata*
but grows in little mounds like
patches close to the ground except
for the flower stems. The tops
of the mesa is sandy and
the holes & mounds of *Dipodomys*
spectabilis were abundant,
a few holes of a smaller species
probably *Perodipus* were seen.
We camped about 12 miles
S.W. of Chin Lee at 4:45 P.M.

+ put up the tent just in
time to get shelter from a
heavy shower. This was followed
by nearly continuous rain
over half the night. The mesa
is a broad undulating
plain extending from the
border of Chin Lee Valley
to the high table mountain
or mesa to the west + has the
best growth of grass we have
seen on the trip. Some Navajo
sheep (3 bands) + quite a
number of cattle + horses
were grazing to the S. West
from Camp. 2 large
deep water holes about
a mile west of the road near
our camp were full
of water + served the stock in
Saw.

The Navajos were camped
near the water with their sheep.

Aug. 6 From Camp on mesa
about 12 m. S.W. of Chin Lee to
Ganado, a distance of about
23 miles ~~in a~~ southeasterly. It rained
hard last night and the roads
were very clayey so that for
the first 2/3 of the way we had
hard pulling across fine grazing
country in the form of a
continuation of the same undu-
lating plain we camped on. In
the late P.M. we struck the
road from Ganado to Kaibab
Canyon + turned eastward into
through a broad pass into
another valley + in about 5 miles
reached J. L. Habbell's headquarter

trading station Ganado.

He has a large store, warehouse & dwelling here & lives in patriarchal style with some of his married & unmarried children & such guests as chance along. We ~~found the family~~ ^{found the family} at a large table at supper & were at once welcomed heartily & taken in to supper. We found here Prof. H. S. Girty - ory wife of Yale (he has the Chair of Geol. formerly occupied by Prof. Dana) He is out on a reconnaissance for water supply for irrigating purposes for the Indians & the Geology.

The plain we traversed during the morning was exactly like that of the St. Louis Atriplex canescens & Gutierrezia Eriogonum & Sarcobatus in all of the lower places the white spined Cactus & small sage like dwarfed tridentata ^{also slender leaved Yucca.} Near the pass leading to Ganado Valley were miles of country in which Gutierrezia was the almost the only shrub or herb & covered the ground so densely that the entire landscape was colored the vivid green of this plant. The high mesas with abrupt escarpments several hundred ft. high & flat. The tops of all high mesas covered with cedar & pinon & the broad valleys all open country.

Aug. 7. Left Ganado
at 10.00 a.m. & travelled in
a westerly course toward
Keams Canon for 24 miles.
Our course led through open
valleys & across mesas
corridor with Cedar & Pinon.
The valley at Ganado is
an open plain like Chin
Lee valley with Cedars on
the bordering mesas. ~~25~~
About 8 m. west of Ganado
we found a group of about
100 yellow pines on the east
border of a mesa about
50 ft high and ~~the~~ surrounded
by pinon & cedar. ~~The road~~
~~left~~ from near this place
we had a good view across the
valley to the south border of the

Sa-la-kai mesa & could
plainly see a patch of pines
^{near the middle} a quarter of a mile long or
so with a few others scattered
along to the west. Our route
after leaving the pines led
for several miles up and over
an undulating mesa with
~~broad~~ broad areas miles
in extent of a strong growth of
Artemisia tridentata. This
mesa was over 7000 ft high.
The Artemisia tridentata rarely
grows to lower border of cedars
but comes in 500 ft or more
above. We found a few new shrubs
or small trees on north slopes
of the ~~the~~ Canon where we camped
just before we came to Eagle Crag.
As usual we found an abundance

of *Atriplex canescens* & 2 species
of *Gutierrezia* all along our
road with ~~of~~ *Yucca baccata*
common ^{with} ~~along~~ the desert sage.
Heavy rains before daylight as
we camped & used water from
a small shower. Many
coal outcrops along the last
thirt of our trip.

Says *Glycyhalitus* & *Tachycineta*
Falco phalaena, Ravens, Spiz.
~~Arizona~~, *Chondestes*
(I can find out a lot of English)
sparrows at Garabito
Pooecetes, Pinnon Jays,
Woodhouse Jay, Turkey buzzard
(at Garabito), 1 Red tail hawk, p.
~~Aug. 8~~ Made about
26 miles & reached the
trading store of J. F. Hubbell Jr

at the old Keams place
at 7 PM. We took the road
leading into head of ~~the~~ Keams
Canyon & when near old Govt
School 2 1/2 miles above store
found it washed out. Had
to recross to east side & come
down a new road. Road
very bad & sandy most of
PM especially in canyon.
Says *glyc.* *Tachycineta*, *Stelgid.*
opteryx, Ravens, Red-tails, *Falco ph-*
alaena, Pinnon Woodhouse Jays
1 family of *Oroscoptes montanus*
(first we have seen) many
~~Shore larks~~ *Otocoris* in small
parties at intervals every day from
Chin Lee valley. At 11 PM
today ^{straggling} a party of 10 *Chondestes henrici*
were seen flying steadily southward

at an elevation of about 30 yd.
They were evidently migrating.
Britsye shot a spec. of Siro-
cassini in the pinyons.

We were hospitably welcomed
by Hubbell and found stopping
with him Mr. Don P. Johnston
Land Examiner, Forest Service,
who has just been on a cross
country journey from here to
Moonlight Utah across the
Black Mountain Country.

He found Pinus ponderosa in
patches on north slope of canyons
above 7000 ft on the south side
of Black Mt. where in numerous
places he visited; none were
more than ^{4 1/2} mile ^{long + in form of}
^{rough belts along edge of canyon side of north slope}
The tops of the Black Mt. mesas
he reports as being covered

with cedar & pinyon forest but
at the head of Blue Canyon
the Indians told him that
some quaking aspens ~~were~~
growing & he noted Douglas(?)
fir ^{on the north slope just below the rim} growing along the north
edge of highest part of the mesa.
Nowhere along the top of the
Mt. was there continuous yellow
pine or fir forest but the level
top of the mesa is overgrown with cedars
(monosperma) and Piñons.

Just before we reached the top of
the Canyon opposite Hubbell's
store & the Fort. Schools a new
^{composite} shrub with small silky bunches of
whitish seed fluffs (spec. saved) came in
abundantly among Atriplex canescens
& Eutima, Pinus, & cedars

Aug. 9. Remained at Kears
Canyon to let the team rest.
Improved the time by getting infor-
mation about the country from
Mr. Johnston, getting off mail
& other odd jobs.

The amount of erosion which has
taken place in Kears Canyon
from high up down to near
its mouth this year is unusual &
is proving a destruction to roads
down the canyon as well as to the small
areas of flat land in the canyon.

All the way from Ganado to
Kears Canyon we saw
scattered earth covered, round
topped, Navajo hogans which
are for winter use & many brush
shelters of similar shape
for summer, the latter sometimes

along side the other. These earth
covered hogans are commonly
excavated a little & are much like
an Eskimo hut in a general way.
Many *Eutamias harrisi* &
Citellus grammurus seen by
Birdseye on broken rock walls of
canyon. Also numerous *Myiarchus*
hummers about flowers in the
bottom. ~~*Spilogale* caught in~~
~~*traps*~~

Aug. 10. Left Kears
Canyon & made 12 miles in
a westerly course to the Moki
pueblo of Walpi. We went
about 6 m. down the canyon to
the mouth & then across open
plain to east base of the mesa
on which the town is built &
camped in the yard of the

school teacher, Dr. W.E. Ireland
The open plain we crossed
is overgrown with *Gutierrezia*;
Atriplex canescens & *confertifolia*
but no *Yucca* or *Atriplex*
tridentata.

Mr. Bridgey & I went on top of
the mesa & looked over the
village for a couple of hours.
It is a wonderfully picturesque
spot but modern cook stoves
in the houses & round awnings
in houses &c are spoiling the
place as an example of primitive
house making.

The Snake Dance takes place
here about the 17th inst. & many
women were hard at work smearing
mud over worn places on
the houses to make them pre-

sentable for the festival when
many strangers appear. We
found the artist Mr. Burbank
on the mesa painting a picture
of the Snake Dance.

Aug. 11 From Walpi to
18 m. to Oraibi. ^{Archibuteo ferrugineus}
^{Junco oreganus}
A very large old *Neotoma arizonae*
was caught in the small garden back
of the house also a spec. of *Perom.*
(wh. ft.) & Dr. Ireland said that
both had been doing a lot of damage.
The Indians also reported that *Perod-*
ipus digs up their seed & eats young
plants & thus does much damage.
The plain ~~from~~ crossed today is
covered with *Atriplex canescens* except
in ~~clayey~~ clayey places in bottom
where it is replaced by *confertifolia*
Gutierrezia & the shrubs of which

specimens were saved with
Ephedra viridis & the small
sage resembling *tridentata* (like
the ones in the window) On top of

Aug. 12 Oraibi

At Oraibi we stopped at
the Govt school & one of the
teachers (Miss Stanley) permitted
us to use her school room to work
& sleep in, gave us water & otherwise
was very friendly. The head teacher
here Mr. Gosnell returned from
Keams Canyon in the eve & offered
his services.

Aug 12 Oraibi by road about
28 miles westerly toward Tuba
Mr. Gosnell was kind enough
to put on his team & haul our
wagon to the top of the mesa
at Oraibi. We crossed

the point of the mesa & down the
other side, across a valley plain
& around another mesa point &
across another valley (Jenebito
wash) & then up on a high mesa
overgrown with cedar. To
the top of this mesa the road was
~~down~~ northwesterly for about 12 miles &
then went southerly about 6 m. to
our camp. We found enough
water ^{wagon road in} in puddles from a recent
shower to water horses & fill
canteens & serve for supper &
breakfast tomorrow.

On low plains & about ends of
mesas we traversed the
most characteristic plants were
Atriplex canescens & *compositifolia*
Sarcobatus (Jenebito wash)

Ephedra viridis
Antennaria & some *Gramma* grass

~~On top of~~
The top of Oraibi mesa is
covered by cedars for several
miles but they come in thin
~~so~~ They are about an acre of
middle mesa also.

On top & n. slopes of mesa
with the Cedars were many
slender leaved yuccas, small
leaved Cercocarpus, *Atriplex*
canescens, *Gutierrezia*
& *Ephedra*.

Aug. 13 Dry Camp on mesa 18 m.
west of Oraibi - NW to Tuba
30 m.

~~On~~ Had to take horses back
2 miles to a spring to drink &
to fill canteen for road today
Left camp at 9:45 2 new
plants in head of canyon near

Camp saved. Same plants
on this mesa noted yesterday.
Our road went south a little
byrd camp then back to NW. past
some Navajo hogans & down to
a lower level out of the cedars.
A spring a little to right of road
as we went down n. slope of mesa
main plants on lower
trailing mesas over which we
traveled for hours are *Atriplex*
canescens, *Ephedra*, *Gutierrezia*
yucca glauca & grass.
At 16 miles from Tuba we
passed a frame house at
head of a wonderful canyon in
the mesa leading into
Mormon's Wash. It was
of the good canyon formation
about 500-800 ft deep &

Superbly colored, pale
gray, bluish & deep red.
Our horses gave out
5 miles E. of Tuba & we
camped by a water hole
in midst of a long, sand
slope leading down to
Moenavie Wash at the
Hopi Pueblo.

Bullock's birds, *Gealia bairdi*,
Otocoris, Mocking bird
Chondestes, *Catherpes*
Buteo calurus, *Falco sparverius*
Carolina doves were the
birds noted.

Aug 14 Tuba
went 5 m. west of
Tuba this morning when
we were hospitably wel-
comed by the Supt. of the

Indian School Mr.
James & his chief clerk
Mr. Kraus. Found
much mail & spent
the day on correspondence
etc.

Aug. 15 Remained at
Tuba. Sent our driver
Frank Kitchum back to
Winslow & it was a good
ridance as he developed
into a disagreeable man
to have in camp & his
team is used up. - He beats
them too much. At work
on reports & correspondence
Birdseye has out his
traps for Coyotes etc.

Aug. 16 Tuba.

Finished my account
for July & worked on com-
pendium & getting notes
in shape. Birds
caught 2 Coyotes last
night

During a walk today saw
Contopus richardsoni

Syrnium saya
Syrnium vociferans
" *verticalis*

Arg. vociferans
Empidonax maculirostris
Salpinctes obsoletus
Stelgid. serripes
Lanius excubitorides
Merula leucoptera
Zenaidura macroura
Astragalinus psaltria
Chondestes
Pooecetes

Spiz. breweri
Carpodacus frontalis
Chondestes kerni
Cathartes
Falco sparverius
and *Buteo swainsoni* (a dark
spec.) perched for a short
time in afternoon on one of the
chimneys of one of the large houses.

Salpinctes
Cathartes
Amphispiza bilineata

Aug 17 - Tuba (Sunday)

" 18 "

" 19 "

" 20 Remained at

Tuba all the week writing
reports & making observations
while B. trapped successfully
for Coyotes which are coming
into the orchards & feeding on

fallen apples & plums. Although
traps were set persistently
for mice in the forest, corn
all about & some 1 1/2 miles away
at Mowsee's place which farm
only one mouse Peromyscus
was caught & it in a warehouse.
On Wed. morning ^{the 18th} we sent
by mail most of the small
specimens collected since
leaving Winslow & I sent my
July account with 24
vouchers. On the morning
of the 19th we learned
that the carrier with yesterday's
mail got into a pick-up in
the Little Colorado R. & lost
the sack containing the mail
including ours.

Stephen Janus
Supt. at Tuba

On the 20th we prepared to leave
for Lerdo as Mr Janus will
not be here for some days. Mrs.
Janus with Mrs Prof. Gregory &
Gale & other ladies came back
from Snake Dance on 19th
the dance was on 7.

Plants about Tuba ^{mainly} were
Sarcobatus

Atriplex canescens & confertifolia

Rhus trilobata

Gutierrezia euthamiae

Chrysothamnus graveolens

Ephedra viridis

Lycium pallidum

Brown blossomed thorny shrub

Opuntia polyacantha

Aug 21 Left Tuba
at 8.30 with 2 good mules
& wagon belonging to the Indian
school & at the farm on Moresque
wash on add 2 mules & an
Indian driver. We then
turned around the point
up a broad bare clay wash
by Moa Ave. now a mission-
ary station & then for about
3 hours followed up by Willow
Springs & stopped at a
small stream 2 miles beyond
for lunch. We then travelled
about 18 miles up the same
canyon wash which runs
south along the west front
of Echo Cliffs. We camped
a little before sunset at
a well in a side canyon

at the extreme head of
Echo Cliffs wash when
the road passes up through low,
strongly contoured clay bad land
hills. Amphispiza bilineata
Chondestes, Lanius, Spizella
breweri & Corvus ^{sinuatus} ~~sinuatus~~, 1 Pooecetes
Willow Spring is in the west base
of the great escarpment of Echo Cliffs
which extend to the Colorado at
Laird Ferry, ~~rise~~ they have an
abrupt escarpment of from 1 to 2000
ft for many miles & front Vermilion
Cliffs on N. side of Colorado
for 15 miles near N. end.
The Cedar began to come in at
5800 ft & at 6000 ft we were
in the cedar belt which
crosses Cedar ridge.

Aug. 22. Left camp at about
 6:30 am & crossed Cedar ridge. We
 passed the divide at once after starting
 & the road lead through a long narrow
 treeless valley lying at base of Echo Cliffs
 about a mile wide & 15 or more long.
 After this the ~~road~~ road continued down
 always near the cliffs & to the NW loomed
 up Vermilion Cliff. We left Cedars &
 pines behind at about 5000 ft. &
 vegetation became more & more
 scarce & stunted as we descended
 toward the river. At about
 Below 5000 ft. new species began
 to come in. At ~~4700~~ ⁴⁷⁰⁰ ft
 a species of lizard Crotaphytus
 came in & was common from 4500
 to 4000. ~~With it~~

Plants on Cedar Ridge
Atriplex canescens
Eriogonum small leaf
Lycium
Gutierrezia 2 kinds
 a gray fine leaved sp. a little like
~~*Artemisia*~~ *Artemisia* same sp. from near Manuelito
Argemone (white poppy) came
 in on N. side of top of the ridge
Gramma grass
 A tall small leaved sp. of *Castilleja*
Thurberia viridis
Yucca baccata
 " *glauca*
 Brown flowered thorny shrub
 At about 4800 ft the country
 became more arid &
 vegetation smaller.
 At 4700 ft *Crotaphytus* *virgatus*
 & a new very slender leaved yucca came
 in together & both were common

This stopped at about 4500 ft

at ~~5000~~ ⁵⁰⁰⁰ ft.

From 5800 to 5000 ft. *Opuntia*
polyantha & *O. Whipplei*
but ^{both} large of this kind were
common with the large
grouped bunches of the red
flowered cylindrical species.

~~Fruit gone from several species~~
~~of *Opuntia polyantha* and~~
At 4700 ft. both *Atriplex*, *Chry-*
othamnus, *Gutierrezia euthamiae*
& the brown flowered shrub &
Ephedra viridis common
in proper soil conditions
& small leaved *Cercocarpus*
along draws where they
get enough moisture.

Birds very scarce on 22^d
Spizella breweri & *arizonae*
Chondestes, *Pooecetes*
Amphisp. bilineata, *Cyanocephalus*

Lanius, *Salpinctes*

From 4500 ft to the river at
the ferry (about 3300 ft. there
is considerable change in vegetation
2 cactuses a long spined
Opuntia (pear leaf) & a spined
pear leaved *Opuntia* common
from on S. side from the ferry
up to about 4500 ft.

~~We finally reached~~ We stopped &
waited at Navajo Springs where
on down a bare & bare reddish
clay slope almost bare of plants
to the dry way along cliff for
a mile up the river bank to a
sand flat a mile above the
ferry ranch. It was nearly
dark & we made camp for the
night after a hard days drive
about 45 miles. The canyon

is much warmer than
the higher country we have just
come from.

The dug road is in dangerous shape
with 2 places where it is sloughing
away endangering wagons.

Aug. 23. Lees Ferry

The ferry man Mr. James S. Emmett
came up to the ferry with a wagon
& 3 girls from 12-18 years old
to help work it. The river
is at flood, running logs &
much trash & it was sometime
before the ferry was worked over
the girls showing all the skill
& efficiency of so many days.
We left our team on the S.
side & took the outfit across
& down to the Emmet Ranch
at mouth of Paria Creek where

Hackberry - 2 trees near ranch
we arranged to stay. Got spec's
of the plants on the south side
of the river. The small leaved
Cercocarpus, Atriplex canescens
A. confertifolia, Gutierrezia euthamiae
Ephedra viridis, the bunch cactus
(red flower) ^{and} Chrysothamnus graveolens
followed down to the river bank
on S. side. The 2 Opuntias &
other specimens represent the
new forms which came in here.
Emmet ranch is a fine place
to stop. They have water melons,
musk melons, cantaloupes, 2 kinds
of grapes, apples & peaches ripe
now with corn & tomatoes. Plenty
spinach & butter. In addition to
the orchard (much neglected)
there is considerable alfalfa on
which 4-5 crops are cut.

With exception of the irrigated land
the vegetation over the country at
the Ferry is extremely bare & the
existing vegetation made up of
small, deplorable examples
of the most hardy desert species.
Atriplex confertifolia, Ephedra viri-
dis are the most common
species. In the afternoon
Rorke & the Navajo Indian
(Albert) who came down with
the team ~~went~~ went back to
the Navajo Spring to camp
and Birdseye went across river
to trap.

Arranged with young William Ewett
to go with us to the Buckskin Mts,
with wagon & 2 horses @ 4⁰⁰ a
day & expenses. Also saddle
horse for Birdseye @ 50¢ a day.

Aug 24 & 25 Lees Ferry.

Aug. 24 Lees Ferry.
An early hunt for birds today
resulted in finding Falco phalaena
Chondestes strigatus Colaptes auratus
Spiz. breweri Dend. aestiva
Corpod. frontalis Zenaidura
Oporornis tolmiei Stelgidopteryx ^{common}
Oocates confinis Scolecophagus Habia melanoceph.

Aug 25 Found Vireo cassinii & V. swainsoni
Dendroica aestiva ————? common
Also 2 sp. Empidonax, Oporornis
tolmiei abundant, Geoth. occidentalis
abundant, Chondestes a few.
Sayornis saya 1, Ardea herodias 1,
Cathartes a. sept. 1, Passerina ^{anyone}
Corpodacus reported doing injury
to ripening tomatoes now & to have
been very injurious to cherries.
Apricots & rock peaches

The small leaved Cercocarpus
common in gulches along north bank
of river. The Datura (Jimson Weed)
Common at ranch.

Frosts

Latest in spring mid-July

Earliest 10-mid Oct.

Crops at Lees Ferry

Sweet Irish Potatoes

Apples

Reaches (early) state

Both of Johnston & Livingston

Apples, Almonds do well

~~Peaches~~, Malaga

Mission Grape

Corn, 4-5 crops alfalfa

There are about 25 acres in

alfalfa & room for more with

about 30 acres of orchard & vineyard

Aug 25 Lees Ferry.

One bunch of Vignaga cactus
photographed & also one of the
spiny pear leaved bunches

The Vignaga said to have red
or purplish red flowers as does
the long-thorned pear leaved sp.

The spineless pear leaved sp.
said to have pink flowers.

The round bunch cactus ~~like~~
which is also common in Cedar
Belt has dark red flowers here
& completes the 4 species found
close to Lees Ferry ranch.

Emmett reports having killed
2 Coons here in several years
residence; a few more also seen
(he had a skin of a yg. one). A civet
cat came into the attic of the house
in winter & while mousing about
fell upon the bed of a school teacher

who was much frightened &
the offender was finally killed.
Emmett says that there is no
outlet for stock up Paria
Canyon way, the only way of getting
out on N. side of river being by way
of Kanab or the Buckskin mts.

He says a fence 15 m. long
would fence in the entire
Buckskin plateau & country
East to Lees Ferry & Paria Canyon.
This fence would begin at
the new red vermilion cliffs &
cross House Rock Valley near
House Rock Spring & thence south-
westwardly to head of box canyon on
Snake Creek.

By saving the grazing above
the Ferry ranch Emmett pastures
about 100 head of cattle & horses

there in winter. On top of Paria
Plateau a cattle man has
water in a ~~natural~~ natural
drainage basin so he runs about
500 head of stock there. A Cattle
Co. in which it is reported that
a Calif. Senator is interested
has a fence across the narrow part
of House Rock Valley E. & W. to hold
stock from drifting northward.
At present there is no winter range
included in the Kaibab Plateau
game preserve & last winter
when heavy snow fell there
the deer all left the preserve
for lower & warmer country &
were then killed in large numbers
by people from the Kanab section.
By adding the country to Lees
Ferry game would have a good
winter range & be really

protected - which is an
impossibility now.

The Calif. cattle Co. are now
running stock on the Preserve

& are said to be opposing any
extension of the game Preserve
for winter range as they are
now occupying a good part of
it about House Rock Valley.

A winter pelage Coyote skin
at Lewis Ferry is iron gray
on back like a gray wolf
but upper sides of nose
& front of forelegs & feet are pale
rusty reddish showing the
Coyote

Last year 100,000 sheep were
crossed at Lewis Ferry at 2 1/2¢
each & 5,000 head in 3 days
before we reached there.

Ematt says the canyon above
the ferry is very narrow & cold in
winter & much ice comes down
& sometimes freezes solid
across at the ferry so that wagons
have been taken over while he
has driven a goat herd over safely
on the ice.

Reached L. Ferry morning of Aug 23
since 23^d - track 27th = 4 days

Aug 26 L. Ferry.

Emmett shot a y. Cooper's Hawk
this morning.

Mammals at L. Ferry

Peromyscus manicillatus —

2 sp. *Peromyscus* on S. side

+ 2 " " on North side

Neotoma arizonae on S. side "

a multitailed species on N. side.

Coyote

Badger

Spilogale

Procyon

Urocyon

Beaver

Bassaris

Emmett has been at Ferry 12

years & at Kanab & in the

country much longer & knows

of black bear being taken twice

in the Buckskin mts & plateau
one of these was in 1908. No
silver tips were known there.
Nor does he know of any elk ever having
been there.

L. Ferry was an old Navajo
crossing by which they ran
through stolen stock from Utah.

They used to cross in winter on
ice & sometimes with rafts & skis.

The Mormons built a rectangular

stone house half a mile above

the ranch where 8 men were kept

as guards in winter to prevent

Navajos using this crossing.

This stopped some of the raids.

Of one party of 14 Navajos on a

horse stealing trip 13 were killed

south of Kanab by the Mormons.

The crossing at L. Ferry was

discouraged by following Navajo
trails. The Mormon Church
for years had an interest in
this project to help Mormons
who were the main users of
it for a long time according
to Emmett.

Aug 27 Soap Creek 15m. SW.
of Lees Ferry (alt. about 4800ft)
Left Emmett's ranch after 10 a.m.
and took the trail SW. along
the front of Vermilion Cliffs on the
way to Buckskin Mts (Kaibab
Plateau). Passed Badger Creek, a
trickling stream 10m. out & 15m. out
came to a similar stream called
Soap Creek on account of its alkaline
water. The Vermilion Cliffs are
fine both in color & the variety

of sculptured butresses along their
entire length. From their bases
a ~~the~~ mesa stands out about
500 ft. higher than the bench
followed by road & has a
fringe of huge boulders about
its base along which the road
travelled. The bases of cliffs &

mesas are very barren but
enough green stuff grows on the
hill cliff slopes to tinge them
with green on the gentler slopes.
On the mesa over which the
road led the vegetation was
sparse & small. *Atriplex confertifolia*
was the most abundant
species & often almost the only one.
Scattering *Gutierrezia euthamiae*, the
long spined *Opuntia*, *Ephedra vir.*?
The small flat plant with hoarfrost like
leaves very abundant. The

slender leaved yucca with
leaves 12-18 in long & stems
2 to 4 or 5 plants in a bunch
& occasional short stem. Also
the straggly low shrub with red bark
& short mesquite-like leaves.

The plants named above were
all along the route but at
about 3700-4000 ft. the inflated
stemmed plant, the green stemmed
species without leaves & minute flowers
& the green stemmed species with
small daisy-like flowers began
to drop out. Along the bank of the
Colorado below ranch we saw
many Lycium bushes with small leaves
& small blue flowers. ~~At about~~

In the gulches we crossed were
Chrysothamnus & *Atriplex canescens*
with small leaved *Cercocarpus*

in draws at 4500 ft. It
appears that the lower Sonoran
at Lees Ferry is below 4000 ft
even on the south front of
Vermilion Cliffs but various
upper & lower Sonoran species intermingle
along the zone from the Ferry to
5000 feet. The arrowwood is
plentiful along the river to about the
ranch.

The green stemmed Composite
with small yellow flower it looks like a
slender stemmed light green species
was noted on slopes & favorable soil
on the mesa all along today's
route.

Cedars & Pinons were common
on Paria Plateau to the edge of
top of Vermilion Cliffs we saw
above Badger Creek & also above

Soap Creek tall solitary trees that
appeared to be yellow pines. Ematt
says there are a few yellow pines on
this plateau but nowhere enough
to be called a forest - merely a few
scattered trees among the general
forest of Cedar & Pinon.

Aug 28 Jacobs Pool -
15 m. from Soap Creek. Alt.
about 5500 ft.

Left camp rather late &
pulled around the southern point
of the million cliffs.

At 5000 ft. elevation we came
^{a greater abundance of}
into typ. Upper Sonoran desert
vegetation for these open plains
of the Colorado. The plains are
sandy & have the following
plants at 5000 ft.

Atriplex canescens abundant
Yucca (shrub, leaved) "
Ephedra viridis "
Eutymia tubifera common
Brown flowered - small shrub "
The *Ephedra*-like composite with
yellow flowers was all along
down to the ferry & thence up
to at least 5500 ft.

The frost-leaved herb, inflated
stem herb & the leafless green
white bell flowered herb reached
their extreme upper limit
at about 5000 ft.
Also the leafless green stem
species with small daisy-like flowers.

In the forenoon the thimble on right
hind axle broke & we were delayed
several hours till old man Emmett
came along & ingeniously bored
a hole in the tire rim & along top of
wooden cone of axle & by means of
wire.

We reached Jacob's Pool just as shower
began on all sides.

Aug. 29 Jacob's Pool
Remained here all day. Heavy
showers ^{night or} all day on every side & especially
over the Buckskin Mts. a few miles west.
Clouds low over mts. & along Verm-
ilion Cliffs. In P.M. a heavy down pour
sent the washes on both sides of us into boom-
ing torrents of red mud & the slopes were
streaming with red mud showing a tremendous
amount of erosion for the short time. The
sandy, slightly clayey soil dissolves like

sugar in flowing water. On our way
from Soap Creek to Jacob's Pool there
was a marked increase in amount of
vegetation in its size showing the
effect of increased rainfall.
The same vegetation listed as at
5000 feet yesterday continued to the Pool
which is located at the ~~Southwest~~ base of
Vermilion Cliffs with 2 corals & a house
the latter belonging to the Grand Canyon Cattle
Co. which has a fence across House
Rock Valley running east from a point
of Vermilion Cliffs ~~up~~ across the valley
(I expect to put it across to head
of Snake Gulch which would
thus shut in everything south as
the cliffs & canyons do the rest.
The Co. now is to run a fence along
top of Buckskin Mts (N & S) the Govt
furnishing wire, in order to keep

their cattle from mixing with those
of the people of this section whose stock
runs to the west.

~~About~~

Coyote Spr.

Aug 30, left Jacobs Pool
in the morning & reached
House Rock Sp. at noon ~~12~~¹² miles
Alt. of valley near spring about 5500 ft.
From here we traveled about 8 miles
to the divide of House Rock Valley which
is about 5800 ft. The Vermilion
~~The desert~~ Cliffs & Buckskin mts
approach narrowing the valley to
about 2 miles wide at the spring
& still narrower farther up when
peaks of the two mts. come within
half a mile or so. Beyond the
divide of the above H. R. Spr. we
descended a similar narrow
valley for about 7 miles to a flat near

Coyote Spr. where the wagon road
crosses the northern end of the
Buckskins. Our camp here was
about 5300 ft.

Vermilion Cliffs are red sandstone &
the Buckskin mts facing them are lime-
stone. From Jacobs Pools to near House
Rock Sp. we were on the red sandy soil
& the same vegetation continued that
we had at the Pools. ~~At about~~ Our
road led up to high ground at the pool
& thence down to lower ground in
bottom of valley up to H. R. Spr. At about
5200 feet were ~~scattered~~ cedars
& at 5300 ft. Cedars were spreading
across the valley. With the cedars
came in an abundance of *Artemisia*
tridentata which was all over valley
thence to divide down to our camp
with Cedars. With the sage & Cedars

A broad leaved yucca with long fruit pods abundant from divide to Camp.

an abundance of ~~some~~ *Eutrochium* & a plant much like it with larger petals; also some *G. euthamiae* the same. *Lycium* seen at Gallup also common. A few bunches of arborescent cacti in pass at about 5100 ft. & became common on top of divide with it at latter place were some white thorned *Opuntia polyacantha* & an *Opuntia* (pear-leaved) with dark red fruit) and another small cylindrical species not collected.

The white sage was very abundant with grama grass in great plenty from top of divide to our camp in an open rounded valley. In addition ~~The desert plants of the sandy~~ numerous 'Old man' shrubs were seen along valley from the Pool to the divide. Near H.R. Spr. the road

passed from sandy soil of Herm. Cliffs to the more rocky limestone soil on west of valley, ~~the~~ This occurred at about 5200 ft. & the great majority of the species dropped out at once & were replaced by those mentioned going with the cedar belt. The cedar belt on E.

side Buckskin mts, begins with scattered trees at a little over 5100 ft in valley, & becomes a well marked belt at about 5500 ft.

On the north slope, beyond divide they are more numerous & go well below our camp at 5300 ft (probably below 5000 ft. at least).

A few *Amorpha*, *Leuc. cernuum* ones seen along road to summit, one was up in a cedar tree. 1 Coyote & the

The white sage is a valley species
+ does not range into the Pinyon
belt but is upper Sonoran being
in lower part of Artemisia tridentata belt.

Hills of numerous Thomomys in
the sand; also Perodipus holes.
All before we reached the
divide. After that no mammals
seen. 1 Sturnella on summit
Cliff Swallows + Aeronautes
abundant n. of divide, not
seen south. Amphisp. nevadensis
rather common in sage brush +
cedars both sides divide.
Sialia bairdi, a few. Frathers of a
Cyanocitta diademata seen on
ground by road on divide.

Aug. 31 Traveled 30 mi. to
Kanab, Utah, Alt. 5000 ft.
Rained hard much of last night
+ well into morning. We broke
camp late + at once climbed up
a steep, very rocky limestone
slope of the northern end of

Buckskin Mts. The top of the
the ridge we crossed is a little
over 6500 ft. The summit is a
broad rolling plain about
10 mi. across cut by canyons
here + there. From last night's
camp over entire ridge is a ^{strong}
growth of Cedars + Pinyons with an
abundance of the small leaved Cerco-
carpus growing to 8 to 12 ft. high.

An abundance of Yucca baccata
Artem. tridentata. The red fruited
Opuntia + O. polycantha +
the bush Opuntia. The Gutierrezia
enthami + the ~~sh.~~ small, white
stemmed Gutierrezia + also a
similar plant extended from
House Rock Valley across into
across Mt. + through to Kanab.
On top of Mt. the highest point

is about 6500 ft. along the summit
we saw a considerable number
of the dark green sp. of sage like
on Dry Mt. with these were
also many bushes of *Quercus gambelii*.
From west base of mt. we traveled
west to Kanab through several
small valleys with low ridges between.
The valleys were open sage brush plain
with the intervening ridges & sides covered
with pinyon & cedar.

In Johnson Cr. Valley we struck a
large shrub 3-5 ft high with an
offensive odor. It displaced the
sage (*tridentata*) & is accompanied
by a gray shrub somewhat like the
Old Man shrub.

Atriplex canescens ^{commonly} occurs in
scattered individuals all along
today's route, most below cedar.

Sept. Transfer to

Lycium, White Sage, Cedars
& large *Cercocarpus* came
in in an open draw at 5500 ft.
surrounded by ~~open~~ sage brush
rolling plain. Broad leaved yucca
Sage brush, *Ephedra* & the 2 small
yellow flowered composites.

The *Ephedra* at last night's camp
& below was the bluish stemmed
sp. while at about 5200 ft the
larger dark green sp. came in.
The bluish one was again seen
near Ryan

We had a risky trip through
rain, mud & swollen torrents in
canyon wash, sep. in 3 m. wash &
reached Kanab at 9:15 Pm. Several
other travelers were stopping here
held up by the storm.

Sept. 1 + 2 Kanab.

We remained here working on reports, accounts, drying outfit & preparing to leave tomorrow. On night of Aug.

Sept. 3 Left

31 the Kanab dam went out & much damage was done all along Kanab Creek.

Sept. 3 The mail came in ^{at noon} completely saturated with water as a result of the storm.

We left Kanab after dinner & drove through Fredonia 6 miles south & thence on to some tanks in the head of a canyon about 6 m. S.E. of Fredonia.

The broad clayey flat plain about Fredonia is a little

under 5000 ft. alt & was covered almost entirely by *Atriplex canescens* *confertifolia* which gave way to sage (art. trid.) & calling *Atriplex canescens* *Gutier. euthamiae*, *Opuntia arborescens* *Artemisia tridentata* comes down to 5000 ft in Kanab valley. Cedars & pinyons are on a low ridge bet. Kanab & Fredonia but thence to Cedar Knoll 16 m. S.E. of Fredonia are open sagebrush rolling plains sloping up toward base of Buckskin Mts.

At our camp by the tanks *Artem. tridentata*, a few *Atriplex canescens* arborescent *Opuntia* and *Gutierrezia euthamiae* & the *Gutierrezia*-like plants found abundantly in House Rock Valley.

alt of Ryan 5800 ft

Sept 4 From Camp at
Tanks ~~to~~ Big Spring in Nail
Canyon. 25 m. S.E. alt. 6400 ft
At about 5500 ft we came
to scattering Cedars & the cedar
belt began at 5800 ft. with a few
pinyons ~~scattered~~ ~~the cedar~~
~~belt at 5800 ft.~~ (see note on p
3d page preceding this)

About ¹⁰ miles from last night's camp
we came to the deserted mining camp
of Ryan with its abandoned smelter
empty houses. The Forest Service
has a house & barn here.

Before reaching Ryan we found
Berberis very common ~~for~~
and just before reaching it
Quercus Gambelii appeared on
n. or n.w. sloping slopes
Rhus trilobata seen below Ryan

Rye, Oats & potatoes growing
well at Big Spring

A little below Ryan the Service berry
bush became common &
was noted for some miles above.
At about 5700 ft the thorny locust-
like bush came into ranges up
to above 7000 ft

From Ryan up to Big Spring several
new bushes came in. The northern
slopes of the hills were densely over-
grown with gambel oak

Big Spring is a fine gushing stream
coming out of side of canyon 100 ft above
bottom & quickly disappears in the loose
gravelly soil.

The forest service has a ~~good~~
small house at Big Spr. where
we camped. Ranger Pratt &
family live there.

Cottontails & Jack Rabbits on
sage brush plain from

Last night's camp up into
cedar belt. Also Amorpha
ophyllus leucurus —.

Sept. 5 Dermotte Park, 26 mi.
S. of Big Spring Alt. 8800 ft.
Traveled up Big Spr. Canyon
for 15 mi. to Dry Park and through
it then across a divide about
9200 ft high & down into Dermotte
Park to Forest Service house where
we met Inspector McCane, Supervisor
Clark & 2 rangers. We camped
here for a couple of days.

At 6400 ft in Nail Canyon
Pinus ponderosa was abundant
on both sides with *Quercus*
gambelii & *Pinus trilobata*
was common up to near 7000 ft.
Quaking aspens came in

in bottom of Canyon at 7000 ft
& were abundant thence
to top of mt. On south slopes the
yellow pine goes up to 9000 ft
& Pinyon up to 8000.

~~There are~~ The top of the mt.
from about 8500 ft to summit
at over 9000 is mainly aspen
& 3 sp. of firs & the balsam.

This makes a distinct fir zone
the best defined of any on the mt.
With the firs in this zone is the
black jack pine (~~*Pinus*~~ *parlatorei*)

From 7300 ft up we saw ~~go~~ ^{go} Thompson's
diggings & at 7600 ft in a cold
spruce grown canyon was what
the first ~~Sand~~ *Pinus* *sq.*

Callosperm. & Chipmunks began
to be noted at about 6300 ft
& range to summit.

a Ranunculus & a
small Gentian seen at
De Motte Park

~~Sept 6 & 7 Remained at
Forest Ranger Cabin in De Motte Park~~

8800ft firs in the sprucewood
at 8500ft in draw sloping east
the firs all dropped out on ^{the} south
slope exposure leaving yellow pines
& aspens. On N. exp. 3 sp. firs,
black jack pine & aspens

Sept 6 Remained at
Dornstevens Cabin in Dornette
Park collecting in vicinity
Junco dorsalis is gathering in
flocks though still moulting &
some yg. just getting ad. plumage.
2 Procaetes seen. 1 Brown Creeper
1 ~~Hylocichla~~ Hylocichla; 1 Wood Creeper
2 pairs Accipiter virens, 1 Dr. Falco
phalaena. A few warblers migrating.
Red squirrels abundant, chattering
call in morning with a little chuck-
chuck - as the only other note.
They are not very demonstrative
but show little fear. They have nests
up spruce trees under which the
ground is covered for several
feet about base of trunk with
a heaped up mass of scales &
stems of ~~the~~ fir cones mainly

of the scaly barked species
apparently though I saw one pile
at least under the rough barked
hemlock made of the cones of
this species. Many of these piles
contain several bushels of cone
scales showing that the same
tree nest is occupied a long time.
The morning was dizzy & the squirrels
were busy feeding or moving about.
In P.M. sun came out and about
3 P.M. I could find but little
movement among these squirrels
but in two cases I found the nest
about $\frac{1}{3}$ of the way up in a small
spruce & by close looking found
the owner sitting motionless on a
limb a few feet away as though
enjoying the warmth of the sun.
Callospermophilus rather common

along the borders of the forest
at edges of park & a small
Eutamias was common
there & also dist. through the
forest.

The forest is made up of the Balsam
(or Corkbarked?) fir; ~~the~~ bark smooth ^{pale} & ^{gray}
the heavily ridged

A hemlock with awns in cone
& heavily ridged bark

A spruce with thin bark covered
with thin scales & no trace of
ridging on bark - cone very small
& slender.

Another spruce with longer
cone and with bark somewhat
like the scaly bark but with
small numerous small
cracks forming ^{small} up & down ridges.
The Black Jack Pine in

smaller number than firs & spruces
also the quaking aspen growing
to large trees among the spruces
and the dwarfed *Juniperus communis*
which is scattered through the
forest often growing at the base of
a large spruce or fir. No other
trees noted about this park.

The forest ranger here Scott
Brown says that Owens the
panther hunter has killed 82
~~but~~ in a little over a year. But
~~few~~ they are still numerous.
There are Coyotes & but no gray
wolves at present. The last track
gone was seen about a year
ago. A few porcupines in the
spruce zone.

Sciurus kaibabensis occasionally
seen up to top of mt. but usually

in yellow pine zone. *Sylvilagus*
gambelii reported by one of the
rangers who has lived on the
mt. many years. He says they are
scarce & difficult to find except
after a fresh snowfall. They can
then be tracked to their shelter
which is a hollow log or other
hole. Positively no Snowshoe
Rabbits nor White-tail Jacks on
this mountain. The rangers
commented on there being no
snowshoe rabbits here though
common in mts. a little farther north.
Callospermophilus & 2 sp. of *Eutamias*
common about an old coral
grown up to a small wood with
small black seeds. The *Eutamias*
of both species were very abundant
there & also many juncos & a few

The yg. of *Regulus calendula* just molting
into its first plumage shot

Spizella breweri. The yg.

Sept. 7 Remained at Dr. Motte
Park Collecting. I caught a
Microtus (*Chilotus*?) under a log
last night & Birdseye a Coyote
in Pleasant Valley just north.
He also saw a Turkey buzzard &
caught a raven in trap which
was eaten by a Coyote.

The yg. of *Regulus calendula* shot today
just molting into its full plumage showing
that they must be medium. Others seen
yg. of *Spiz. breweri* in the yg. spotted
breasted plumage shot. Some juncos are
still in partly immature plumage.
The *Geothlypis trichas* shot yesterday
had remains of a small *Eutamias*
in its crop. The forest ranger
has reports that Coyotes are

abundant recently in Pleasant
Park 3-4 m. north of here where
they are feeding on a kind of large
cricket which was very abundant.
The recent cold storm probably caused
them to disappear as they are now gone.

Blue grouse are said not to
occur in the high spruce
ridges but to frequent the breaks
of the Grand Canyon. Both the
Forest Ranger Brown & our man
Dunnett agree in this. Brown
says he has often opened the
crops of these grouse & found them
full of the needles of the yellow pine
or the Bull Pine or Black Jack
which grows with the yellow pine.
He says they often eat aspen ~~leaves~~
buds.

Sept. 8 Left DeMotte Park
through the south end & traveled
16 miles to Bright Angel Spring
(alt 8000 ft.) just west of the head
of Bright Angel Creek.

On the road saw Sialia bairdi, Buteo
calurus, Falco phalaena, Oreoscoptes montanus
(in the Park), Otocoris, Spiz. breweri,
Pooecetes, Merula propinqua, Corvus,
Cyanocitta, Colaptes cafer (2).

DeMotte Park is about 8 m. long N & S.
& averages about 1/4 mile to 1/2 m. wide
& bordered by spruce & aspen grown
ridges on both sides. After leaving the
Park where 3 coyotes were seen, the road
wound down a narrow draw through
a dense spruce ^{& fir} forest to a narrow
open draw with spruce, fir, black
jack pine & aspens on the slope facing
the E. & yellow pines, spruce, fir &

aspens on slope facing west.
At 8800 ft on S. slopes the common
"brake" fern came in commonly.
At 8500 ft. Considerable numbers
of yellow pines came in on ^{south} slopes ~~near~~ on upper half at
least of the hills. In some places
the yellow pines were predominant but
usually well mixed with spruce, fir,
and aspens.

We passed upper & lower Thompson
springs & then came to a fenced
pasture & Forest Ranger's cabin
just above Bright Angel Spring which
is our camping place.

Just back of our tent on the N. exposure
of a hill is dense fir, spruce & aspen
forest while on the opposite side
of the small meadow is a low
slope facing south on which yellow

pine is predominant with ^{numerous} ~~some~~
aspens. The altitude here is 8000.

Sept 9 - Bright Angel Sp.
Remained at this camp collecting
microtus, Peromyscus, ~~2 sp~~ ^{large}
Eutamias, Callospermoph. &
Sciurus mog. On hill + fir
grown hill back of tent
Numerous gophers in flat
+ a few Sciurus kaibabensis
among yellow pines here.

Neotoma signs in ledges, also one
porcupine den located by Bird.

Sept. 10 Bright Angel Sp.
Remained at this camp collecting
Bushy tailed woodrat caught in
rocks near spring. Flocks
of Cyanocephalus flying over. Troglodytes
parkmanni 1 shot last m., also
Hypocichla (49) & Contopus richardsoni 49

+ yg. Sharpshin + Sparrowhawk

Sept 10. Remained at Bright Angel Sp. Camp.

During the day, I went about 2 miles south easterly to Bright Angel Point overlooking the Grand Canyon & directly across from the Santa Fe R.R. hotel on S. side of Canyon. The view was superb as the Point is at the end of a long narrow ridge with branches of Bright Angel ^{Canyon} Creek on both sides several thousand ft. deep & the Canyon to the Colorado in front. The alt. 8000 ft. was enough to give a fine view over the great plateau on south side which appears to be a broad slightly undulating wooded

plain as far as I could see with San Francisco & a few other mts. rising from it. It was extremely interesting to find Cedars, pinyons, manzanita, 2 sp (small leaf & long narrow leaf) of *Cercocarpus* & other upper Sonoran plants occupying the slopes facing south clear to the very rim of Canyon at 8000 ft. while on opposite or north slopes down for a long distance from rim were vigorous growths of *Pseudotsuga* & *Abies arizonica*.

On the flat tops of the mesa immediately back of the rim is Transition forest of yellow pine Gambel Oak wild locust with occasional trees of the flat leaved Cedar along the

rim. It was a surprise to find no *Pinus ponderosa* growing below rim of canyon on N. or S. slope when I visited it but to find these slopes occupied by Cedar & Spruce on one side with ^{a few} scattered ~~Spruce~~ *Pseudotsuga* on S. slopes & with Spruce & fir exclusively on the other slope except for occasional Cedar & Spruce & patches or scattered Aspens.

The line of demarcation bet. Upper Son. on S. exposure & the transition on top of mesa at rim of canyon is extremely well defined & some photos I took show this well.

From the canyon rim several birds not seen before on the mt were noted: several *Picicorvus*, and

2 *Myadestes* & 2 Golden Eagles the latter soaring 2000 ft. below. *Regulus*, Robin, 2 ^{*Basol. inornatus*} ~~*Basol. inornatus*~~ *Slickers* & *Centurus richardsoni* were seen on top as was 1 *Dend. regalis* *Obscurus* which was shot. Its crop contained leaves & seed pods of some small herb & crop & gizzard had no trace of pine needles. These birds live only along the border of canyon rim according to forest rangers. They feed along the top of mesa & when alarmed pitch over down slopes of canyon where Spruce & Spruce ~~are~~ *are* abundant.

We wish to get about
6 specimens of the White-
tail squirrels

And would like 1 good buck deer

Only these are for the
Department Collection

Have you any objections
to this. Of course I do not
wish to take anything against
your wishes.

I only care for a big one

How far
Are

How big antlers

~~Owner~~ n

When do you expect

Owner back

He ought to be here then
tomorrow or day after

Distances & Elevations

		miles	Elevation
July 25-29	Winslow - Mammulito	145	6200
" 30	Mammulito - Ft. Dr. Finney	35	6800
" 31	Ft. Dr. Finney - Sawmill	15	7800
Aug 2	Sawmill - Chin Lee	35	5600
" 4-5	Chin Lee - Canyon de Chelly rrt.	14	5800
" 5	" " - Camp on mesa	12	6300
" 6	Camp on mesa - Ganado	30	6400
" 7	Ganado - Camp on mesa	24	6500
" 8	Camp on mesa - Keams Canyon	26	6400
" 9	Remained at Keams	"	
" 10	Keams C. - Walpi	12	5900
" 11	Walpi - Oraibi	18	6000
" 12	Oraibi - Camp on mesa	18	6200
" 13	Camp on mesa to camp near Tuba	30	4300
" 14	Camp near Tuba - Tuba	5	4500
" 15	Ketchum returned to Winslow with his outfit (about 125 m.)		
" 21	Tuba - Cottonwood Junk	30	6000
" 22	Cottonwood Junk - Luis Ferry	45	3200
" 27	Luis Ferry - Soap Creek	15	4600
" 28	Soap Creek - Jacob Pool	15	5500
" 30	Jacob Pool - House Rock Spring	12	5500
" "	House R. Spr. - near Coyote Spr.	15	5300
" 31	near Coyote Spr. - Kanab	30	5000
Sept. 3	Kanab - Water Pocket ss. of Fredonia	12	
" 4	Water Pocket - Big Spring	25	6400
" 5	Big Spring - Dr. Motte Park	26	8800
" 8	Dr. Motte Park - Bright Angel	16	8000
	Total miles to Sept. 8	660	

Prairie dog

~~It's~~ t-glaw last syl. prolonged

Sciurus aberti

ghlō' tēh' - kái'

Sciurus mogadonensis

ghlō'-zīs - zheer'-ē

Neotoma arizonae

hlay-ēt'-sō hlay-ēt'-sō

Chordilus kernyi

Bēē'-e-zheē'

8
Hesperomys from 6 m below
St Michaels north for about
28 m. savannas 10 m wide

Eutamias

Gray Chipmunk from St. Defiance
the light one on mt. is

Hû-zây-tsoó-i Hû-zây-tsoó-i

Perodipus

nah-hû-tay-é'

~~Yg. Onychomys~~

~~filag. é' sá~~

Peromyscus

nah-ah'-tsoó-téi

~~Thomomys~~

~~nah-ah-tso~~

Callospermophilus

Hû-zây-tsoó lat. spl. prolonged

Thomomys

nah-ah-tsoó-é'

Films Sent in

- no 1. Bonito Canyon above Defiance
" 2 Mt. above Defiance (NW)
" 3 Canyon de Chelly & Road to Gauch

sent in only 10

Ranger Brown says there is
a man in Kanab who
knows the Mt. Iron Bull
district well. His name is
Winey Mace

